HOST PLANT RANGE OF ARBOREAL NESTING RED ANTS IN KANYAKUMARI DISTRICT OF TAMIL NADU (INDIA)[1]

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Key words: Host range, red weaver ants, *Oecophylla smaragdina.*

In Kanyakumari dist. 68 species of flowering plants harbour Asian red weaver ants (*Oecophylla smaragdina* Fb.). The frequency of arboreal nesting on these plants has been analysed in this article.

INTRODUCTION

Kanyakumari, the southernmost district of India, lies between 8° 5' - 8° 30' N lat. and between 77° 10' - 77° 36' E long., covering an area of 1,684 sq. km. Of this, 446 sq. km are forests. All areas, except forests, were surveyed during this study.

Red weaver ants are found from India to Queensland, Australia and Solomon Islands (Lokkers, 1986.) It is generally believed that the Asian red weaver ants live in broad leaved evergreen trees (Bingham, 1903). The present study reveals that they also live on deciduous trees, small leaved trees and on some climbers.

Oecophylla smaragdina is a major pest of some fruit trees and minor pest of some other trees. It reduces the yield or causes difficulties during harvesting and management of farms. Even though it does not cause much direct damage to the crops, some of its associates are harmful. However, *O. Smaragdina* has been known to protect some plants from harmful insects (J.D. Tothill *et al.* 1930). The present investigation illustrates the frequency of nesting of arboreal red weaver ants in various species of flowering plants in the study area.

MATERIAL AND METHODS

Field trips were frequently conducted to different parts of the study area, and plants were observed for nests of red weaver ants. The plants with red ants were floristically studied and dried specimens were deposited at the Department of Botany, Vivekananda College, Agasteeswaram. The frequency of nesting of red ants, average number of nests per plant and average number of leaves found in the nests were recorded. (Table 1).

RESULTS AND DISCUSSION

Table 1 shows the frequency of nesting of red weaver ants on the plants of the study area. Red weaver ants build their nests on 68 species of flowering plants in the area. High frequency of nesting was noticed on *Calophyllum inophyllum, Thespesia populnea, Anacardium occidentale, Pithecellobium dulce* and *Erythrina variegata.*

The frequency of occurrence of nests of red weaver ants was low (20%) in *Polyalthia longifolia, Hibiscus rosa - sinensis, Citrus acida, Citrus medica, Murraya koenigii, Azadirachta indica, Gliricidia maculata, Tamarindus indica, Albizia lebbeck, Lawsonia inermis, Carica papaya, Ixora coccinea, Eupatorium glandulosum, Nerium odorum, Thevetia peruviana, Ervatamia divaricata, Plumeria rubra, Brugmansia suaveolens, Manihot esculenta, Manihot glaziovii, Phyllanthus acidus, Jatropha glandulifera, J. curcas, Ricinus communis, Ficus religiosa, F. benghalensis, Morus australis, Musa paradisiaca, Areca catechu, Borassus flabellifer, Cocos nucifera* and in *Caryota urens.* In cultivated species the

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TABLE 1

HOST RANGE OF RED WEAVER ANTS IN KANYAKUMARI DISTRICT

No.	Name of plant	Family *	No. of plants studied	No. of plants with red ants	No. of nests per plant	No. of leaves per nest●
1.	*Annona squamosa* L.	Annonaceae	410	98	3-15	3-7
2.	*Annona muricata* L.	Annonaceae	63	30	1-24	3-6
3.	*Polyalthia longifolia* (Sonn.) Thwaites	Annonaceae	72	9	3-21	1-8
4.	*Tinospora cordifolia* (Wild.) Hook f. & Thomson	Menispermaceae	74	22	1-7	1-5
5.	*Craeteva roxburghii* R. Br.	Capparaceae	20	4	4-23	1-3
6.	*Calophyllum inophyllum* L.	Clusiaceae	210	163	>50	3-7
7.	*Thespesia populnea* (L.) Sol. ex. Curr. Serr.	Malvaceae	412	213	>50	1-4
8.	*Hibiscus rosa - sinensis* L.	Malvaceae	672	18	3-11	3-10
9.	*Hibiscus tiliaceus* L.	Malvaceae	231	81	>50	1-3
10.	*Bombax ceiba* L.	Bombacaceae	11	6	7-43	1-4
11.	*Eriodendron pentandrum* (L.) Kurz	Bombacaceae	43	20	23-44	1-3
12.	*Citrus acida* L.	Rutaceae	232	39	3-18	3-9
13.	*Citrus medica* L.	Rutaceae	212	42	3-12	3-8
14.	*Murraya koenigii* (L.) Spreng.	Rutaceae	79	12	3-11	1-7
15.	*Aegle marmelose* (L.) Curr. Serr.	Rutaceae	12	3	>50	1-3
16.	*Limonia acidissima* L.	Rutaceae	11	4	>50	3-7
17.	*Azadirachta indica* Adr. Juss.	Meliaceae	223	17	3-31	3-8
18.	*Anacardium occidentale* (L.)	Anacardiaceae	129	73	>50	3-8
19.	*Mangifera indica* L.	Anacardiaceae	413	123	>50	4-7
20.	*Erythrina variegata* L.	Papilionoideae	79	42	24	1
21.	*Pongamia glabra* Vent.	Papilionoideae	34	9	9-49	1-3
22.	*Gliricidia maculata* (Sleudel.) Kunth	Papilionoideae	642	21	5-21	1-3
23.	*Abrus precatorius* L.	Papilionoideae	33	7	7-49	1-3
24.	*Tamarindus indica* L.	Caesalpinioideae	112	1	19	3-7
25.	*Cassia fistula* L.	Caesalpinioideae	12	3	11-27	3-7
26.	*Cassia surattensis* Burm. f.	Caesalpinioideae	9	4	19-26	3-7
27.	*Cassia senna* L. var. senna,.	Caesalpinioideae	42	9	9-31	2-6
28.	*Pithecellobium dulce* (Roxb.) Benth	Mimosoideae	73	63	>50	7-23
29.	*Albizia lebbeck* (L.) Benth	Mimosoideae	213	31	38-47	31-3
30.	*Prosopis juliflora* (SW). DC	Mimosoideae	1172	130	7-21	5-17
31.	*Terminalia catappa* L.	Combretaceae	43	11	>50	1-3
32.	*Syzygium jambolanum* (Lam.) DC.	Myrtaceae	42	17	20-49	3-7
33.	*Psidium guajava* L.	Myrtaceae	110	24	3-40	1-3
34.	*Lawsonia inermis* L.	Lythraceae	79	8	1-13	3-8
35.	*Carica papaya* L.	Caricaceae	413	2	1-2	1
36.	*Coccinia grandis* (L.) J. Voigt	Cucurbitaceae	23	7	1-7	1-3
37.	*Morinda coreia* Buch-Ham.	Rubiaceae	342	84	7-43	4-9

TABLE 1 *(contd.)*

HOST RANGE OF RED WEAVER ANTS IN KANYAKUMARI DISTRICT

No.	Name of plant	Family *	No. of plants studied	No. of plants with red ants	No. of nests per plant	No. of leaves per nest●
38.	*Ixora coccinea* L.	Rubiaceae	173	13	1-12	1-7
39.	*Eupatorium glandulosum* Kunth.	Asteraceae	173	13	1-9	1-5
40.	*Manilkara zapota* (L.) P. Royen	Sapotaceae	27	9	7-32	3-8
41.	*Madhuca longifolia* (J. Koening) Macbr.	Sapotaceae	12	4	7-48	3-7
42.	*Nerium odorum*	Apocynaceae	302	23	3-17	3-11
43.	*Thevetia peruviana* pers.	Apocynaceae	89	13	7-23	3-11
44.	*Ervatamia divaricata* (L.) Burkill.	Apocynaceae	74	3	3-43	3-7
45.	*Plumeria rubra* L.	Apocynaceae	31	3	3-10	1-3
46.	*Pergularia daemia* (Forsskal) Chiov.	Asclepiadaceae	132	51	1-7	3-6
47.	*Cosmostigma racemosum* (Roxb.) Vight	Asclepiadaceae	112	37	1-7	3-6
48.	*Brugmansia suaveolens* (Willd.) Bercht & J.S. Presl	Solanaceae	141	9	1-8	1-3
49.	*Vitex altissima* L.f.	Verbenaceae	74	21	1-9	2-7
50.	*Piper nigrum* L.	Piperaceae	43	9	1-13	1-3
51.	*Loranthus elasticus* Desr.	Loranthaceae	43	12	1-3	2-4
52.	*Manihot esculenta* Crantz.	Euphorbiaceae	1730	127	1-4	1-3
53.	*Manihot glaziovii* Muell. Arg.	Euphorbiaceae	127	4	>50	1-7
54.	*Phyllanthus acidus* (L.) Skeels.	Euphorbiaceae	37	6	3-19	1-3
55.	*Jatropha glandulifera* Roxb.	Euphorbiaceae	218	9	1-6	1-4
56.	*Jatropha curcas* L.	Euphorbiaceae	461	29	1-8	1-3
57.	*Exoecaria robusta* Hook f.	Euphorbiaceae	39	11	1-10	1-3
58.	*Ricinus communis* L.	Euphorbiaceae	128	18	1-19	1-3
59.	*Artocarpus heterophyllus* Lam	Moraceae	99	41	>50	1-7
60.	*Artocarpus incisus* L.F.	Moraceae	73	18	>50	1
61.	*Ficus religiosa* L.	Moraceae	29	2	7-21	1-5
62.	*Ficus benghalensis* L.	Moraceae	63	1	27	1-3
63.	*Morus australis* Poiret.	Moraceae	179	7	1-9	1-5
64.	*Musa paradisiaca* L.	Musaceae	1129	12	1-4	▲
65.	*Areca catechu* L.	Arecaceae	743	79	1-7	+
66.	*Borassus flabellifer* L.	Arecaceae	142	13	1-9	+
67.	*Cocos nucifera* L.	Arecaceae	275	19	1-7	+
68.	*Caryota urens* L.	Arecaceae	27	1	4	+

* Arranged according to *An Excursion Flora of Central Tamilnadu, India.*

▲ Leaf axil, leaf foldings and in bunches.

+ Leaf axil, inflorescence axis, basal portion of leaflets and in bunches.

● In old nests.

frequency of nesting was poor due to frequent human interference during cultivation. Nesting of red weaver ants on cultivated plants indicated poor management of the plants. Nests were seen on *Azadirachta indica, Albizia lebbeck, Carica papaya, Manihot esculenta, Musa paradisiaca* and *Caryota urens* when they were growing near trees with red weaver ants.

It is generally believed that the red weaver ants live in broad leaved evergreen trees (Bingham, 1903), as observed in this study. However, the occurrence of weaver ants was not limited to broad leaved and evergreen trees. Plants with small leaves such as *Pithecolobium dulce* and *Tamarindus indica* also harboured the ants. The frequency of occurrence is higher in *P. dulce* than *T. indica*. The weaver ants inhabited *T. indica* only when the tree was growing in close association with other trees with dense population of the ants. The frequency was low in *Azadirachta indica*, which might be due to the presence of azadirachtin in its leaves. However, no investigation was made to test this.

Evergreen species were more suitable for nesting than deciduous plants. The red weaver ants were observed in deciduous plants such as *Bombax ceiba, Eriodendron pentandrum, Ficus religiosa* and *F. benghalensis*, but the frequency was low. The frequency was low in *F. religiosa* and *F. benghalensis* even if they were growing by other plants with dense population of weaver ants.

Over 80% of the plants inhabited by weaver ants had leaves with smooth surface and with poorly developed epidermal hairs. Dense epidermal hairs on leaves hamper the free movement of weaver ants and thereby reduce the frequency of nesting.

There are several reports of the occurrence of red weavers ants on cultivated species such as coconut (Tothill *et al.* 1930), date palm (Debach, 1974), *Citrus* spp. *Annona reticulata* and *Eugenia caryophyllus* (Hill, 1983), jack tree, cashew, litchi and mango (Seshagiri Rao, 1972), arecanut palm (Kumaresan, 1994). The present study added some more plants to the list. *Murraya koenigii, Hibiscus rosa-sinensis. Annona squamosa, Lawsonia inermis, Morinda coreia, Carica papaya, Ixora coccinea, Nerium odorum, Ervatamia divaricata, Plumeria rubra, Ricinus communis, Phyllanthus acidus, Musa paradisiaca, Borassus flabellifer,* and *Caryota urens* were new records. Lack of proper management and the presence of infested trees nearby might be the reason for occurrence of weaver ants on these plants.

Even though in recent years red weaver ants have been used as biological agents to kill insect pests of plants, they have been considered as major or minor pests for some crop plants, because they spread some pests like coffee green scales (Hill, 1983).

The spatial separation of the population of weaver ants and plant species might also be a reason why the ants did not build nests on some plants. So it was difficult to identify the species which were not preferred by weaver ants in the study area. Artificial introduction of weaver ants on such plants may give full information regarding host plant preference by red weaver ants.

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REFERENCES

BINGHAM, LT. COL. C.T. (1903): The Fauna of British India Including Ceylon and Burma. Hymenoptera-II. Today and Tomorrow's Printers & Publishers, New Delhi.

HILL, DENNIS, S. (1983): Agricultural Pests of Tropics and their Control. Cambridge University Press.

GAMBLE, J.S. & C.E.C. FISHER (1939): The Flora of

Presidency of Madras (3 Vols.) Botanical Survey of India, Calcutta.

Kumaresan, V. (1994): Myrmecophily: A Harmful Association on *Areca catechu.* L. *J. Swamy Bot. Club.* Vol. 11: 59.

Lokkers, C. (1986): The Distribution of Weaver Ants *Oecophylla smaragdina.* (Fabricus) (Hymenoptera: Formidae) in Northern Australia. *Australian Journal of Zoology. 34(5)*: 683-687.

Matthew, K.M. (1981): Illustration on the Flora of the Tamilnadu Carnatic. The Rapinat Herbarium. Tiruchirapalli.

Matthew, K.M. (1991): An Excursion Flora of Central Tamilnadu, India. The Rapinat Herbarium. Tiruchirapalli.

Debach, Paul (1974): Biological Control of Natural Enemies. Cambridge University Press.

Seshagiri Rao, D. (1972): A Handbook of plant Protection. S.V. Rangaswami and Co. Pvt. Ltd. Bangalore.

Tothill, J.D., T.H.C. Taylor & P.W. Baine (1930): The Coconut Moth in Fiji: A History of its Control by means of Parasites. *Publ. Imp. Entomol.* Commonwealth Institute of Entomology, London. pp 269.